Characterization of Printed Components Under Space Conditions

Completed Technology Project (2014 - 2016)

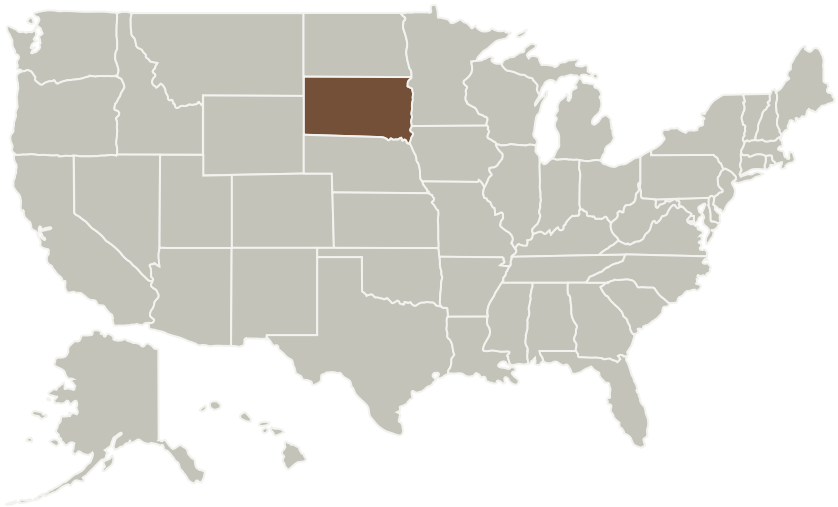
Project Introduction

Characterization of the survival of digitally fabricated (printed) components in space environments is a crucial step towards the ultimate manufacture and application of printed spacecraft. Little data currently exists to fill this void; therefore, this proposed research will help to fulfill NASA's Space Technology Roadmap TA12: Materials, Structures, Mechanical Systems, and Manufacturing by providing the starting database necessary to push the advanced manufacturing process of digital fabrication into usage on NASA missions. The enabling of this novel manufacturing process would in turn give NASA personnel new, groundbreaking tools to accomplish previously infeasible mission and could ultimately lead to on-demand manufacturing in space.

Anticipated Benefits

This research will help to fulfill NASA's Space Technology Roadmap TA12: Materials, Structures, Mechanical Systems, and Manufacturing by providing the starting database necessary to push the advanced manufacturing process of digital fabrication into usage on NASA missions. The enabling of this novel manufacturing process would in turn give NASA personnel new, groundbreaking tools to accomplish previously infeasible mission and could ultimately lead to on-demand manufacturing in space.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Space Technology Research Grants

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Organizations Performing Work	Role	Type	Location
South Dakota School of Mines and Technology	Supporting Organization	Academia	Rapid City, South Dakota

Primary U.S. Work Locations
South Dakota

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

Program Director:
Claudia M Meyer

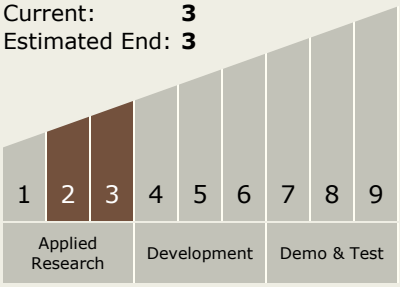
Program Manager:
Hung D Nguyen

Principal Investigator:
Grant A Crawford

Co-Investigator:
Ian S Markon

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.1 In-space Propellant Storage & Utilization